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(54) COVER TAPE FOR PACKAGING ELECTRONIC PART

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate seal temp. dependency of peel-off strength by forming a heat-sealing cover tape with a specified biaxially drawn film, a heat sealant layer contg. a specified amt. of a filler with a specified particle diameter in a thermoplastic resin with a specified softening temp. and a polyethylene intermediate layer.

SOLUTION: The outer layer 2 of a cover tape 1 is a biaxially drawn film made of either a polyester, a polypropylene or a nylon. The intermediate layer 3 is made of a polyethylene, a polystyrene or a mixture of a polyethylene, a polystyrene and a hydrogenated styrene block copolymer and the heat sealant layer 4 consists of a mixture of a thermoplastic resin and a filler. The thickness of the heat sealant layer 4 is pref. 0.2-3 μ m and it consists of a mixture contg. 1-60 pts.wt. filler with a particle diameter of 0.2-20 μ m to 100 pts.wt. polymethacrylate or vinyl chloride-vinyl acetate copolymer with a softening temp. of 40-130°C.



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CLAIMS

[Claim(s)]

[Claim 1] It is the covering tape which can carry out a heat seal to the carrier tape made from plastics. This covering tape The biaxially oriented film which is polyester, polypropylene, or nylon, it is 1 - 60 weight ***** about the filler whose softening temperature is the particle size of 0.2-20 micrometers to the thermoplastics 100 weight section which is 40 degrees C - 130 degrees C -- with the heat sealant layer which consists of mixture The covering tape for an electronic-parts package characterized by having the middle class who uses polyethylene as a principal component between said biaxially oriented film and said heat sealant layer.

[Claim 2] The covering tape for an electronic-parts package according to claim 1 on which said middle class is characterized by consisting of a resin constituent with which 5-100 weight section addition of the polystyrene whose melt flow rates are 10-30g / 10 minutes was carried out to the polyethylene 100 weight section whose melt flow rates are 10-30g / 10 minutes.

[Claim 3] The covering tape for an electronic-parts package according to claim 1 on which said middle class is characterized by consisting of a resin constituent with which 1-50 weight section addition of the hydrogenation styrene system block copolymer whose polystyrene whose melt flow rates are 10-30g / 10 minutes is the 5 - 100 weight section, and whose melt flow rates are 30-250g / 10 minutes was carried out to the polyethylene 100 weight section whose melt flow rates are 10-30g / 10 minutes.

[Claim 4] The covering tape for an electronic-parts package according to claim 3 on which said hydrogenation styrene system block copolymer is characterized by being a kind at least of a hydrogenation styrene-butadiene-styrene block copolymer and the hydrogenation styrene-isoprene-styrene block copolymers.

[Claim 5] The covering tape for an electronic-parts package according to claim 1, 2, 3, or 4 characterized by said thermoplastics being polymethacrylate or a vinyl chloride vinyl acetate copolymer.

[Claim 6] The covering tape for an electronic-parts package according to claim 1, 2, 3, 4, or 5 characterized by being any one sort or such mixture among the oxide particle to which said filler uses as a principal component any of silicon, magnesium, and calcium to be or a polyethylene particle, a polyacrylate particle, and a polystyrene particle.

[Claim 7] The covering tape for an electronic-parts package according to claim 1, 2, 3, 4, 5, or 6 characterized by for the thickness of said biaxially oriented film being 5-30 micrometers, for said interlayer's thickness being 5-50 micrometers, and the thickness of said heat sealant layer being 0.2-3 micrometers.

[Claim 8] The covering tape for an electronic-parts package according to claim 1, 2, 3, 4, 5, 6, or 7 characterized by forming an interlayer's resin so that the peel strength of this covering tape and a carrier tape may be set to 10-120gr per seal width of face of 1mm.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention protects electronic parts from contamination, on the occasion of storage of electronic parts, transportation, and wearing, since it mounts in an electronic-circuitry substrate, it is aligned, and it relates to the covering tape by which a heat seal may be carried out to the carrier tape made from plastics which formed the receipt pocket among the package objects which have the function which can be taken out.

[0002]

[Description of the Prior Art] In recent years, electronic parts for surface mounts, such as transistors including IC, diode, a capacitor, and a piezoelectric-device register, are packed and supplied to the package object which consists of a covering tape which can carry out the heat seal of the pocket which can be contained, and by which embossing shaping was carried out to the carrier tape made from plastics formed continuously, and a carrier tape according to the configuration of electronic parts. After the electronic parts of contents exfoliate the covering tape of a package object, they are taken out automatically and a surface mount is carried out to an electronic-circuitry substrate. Although the reinforcement at the time of a covering tape exfoliating from a carrier tape was called PIRUOFU reinforcement, when this reinforcement was too low, at the time of package object migration, the covering tape separated and there was a problem that the electronic parts which are contents were omitted. On the contrary, when too strong, the phenomenon which jumps out of a receipt pocket just before a carrier tape vibrates and being equipped with electronic parts, in case a covering tape is exfoliated, i.e., a jumping trouble, had occurred. The device when exfoliating from the carrier tape of current and the covering tape by which Kamiichi is carried out is classified into three, an interfacial-peeling type, an imprint exfoliation type, and a cohesive failure type. The sealing surface of a covering tape and a carrier tape exfoliates, the glue line itself is imprinted at a carrier tape at the time of exfoliation, and, for a glue line, the imprint exfoliation type of an interfacial-peeling type is [a cohesive failure type] a thing of a type which exfoliates when another different layer or the different glue line (it is henceforth called a cohesive failure layer) itself is torn. Although there are merits and demerits by each type, if only the condition at the time of exfoliating the covering tape by which the seal was carried out to the carrier tape is compared, since an interfacial-peeling type has a sealing surface and the same stripped plane, it will be easy to be influenced of the configuration of a carrier tape, the quality of the material, and description, and PIRUOFU reinforcement will tend to become unstable.

[0003] On a device, a glue line needs to be a thin film, the so-called lacquer for heat sealing must be used, PIRUOFU reinforcement tends to become sensitive to seal temperature, and an imprint exfoliation type has it in suitable PIRUOFU reinforcement. [difficult to get] Since, as for a cohesive failure type, a sealing surface differs from stratum disjunctum, it has the big advantage in which there are few seal condition dependencies of PIRUOFU reinforcement, and it is not influenced of the configuration of a carrier tape, the quality of the material, and description. However, at the time of exfoliation, it may be influenced of layers other than a glue line and a cohesive failure layer, and interfacial peeling may happen, without cohesive failure happening. Moreover, it may be hard to set up the location which a cohesive failure layer destroys, a cohesive failure layer may remain in the front face of a carrier tape at the time of exfoliation, and the condition (it is henceforth called DERAMI) that it becomes impossible to take out contents may happen. Since it is tear[of a cohesive failure layer itself]-easy and is designed, it is the mixture of two or more resin which cannot be mixed easily in many cases, and homogeneity may not be mixed, this thing may worsen the transparency of a covering tape, or they

may make the fault by the aggregate. Moreover, in the case of such an application, that in which thermal resistance is inferior among the resin in mixture may be contained. For these reasons, at the time of cohesive failure layer film production, these aggregates or a degradation object appears and there is a case where productivity is dropped, plentifully. For example, if formation of a cohesive failure layer is tried using combination of the block copolymer of the polyethylene and polystyrene which are shown in claim 5 of Japanese JP,1347759,B (applicant YUSEBE SOSHIETE ANONIMU), elastomer-like styrene-styrene butadiene rubber, or styrene-isoprene-styrene and working temperature exceeds 200 degrees C, a butadiene or an isoprene component will make a lifting and an aggregate for a polymerization reaction, and a production yield will get remarkably bad.

[0004]

[Problem(s) to be Solved by the Invention] The purpose of this invention does not have the seal temperature dependence of the PIRUOFU reinforcement at the time of a covering tape exfoliating from a carrier tape by using condensation exfoliation, and aging by the storage environment of many engine performance obtains the covering tape by which seal nature was stabilized small.

[0005]

[Means for Solving the Problem] This invention is the covering tape which can carry out the heat seal of the pocket which contains electronic parts to the carrier tape made from plastics formed continuously, this covering tape is a biaxially oriented film whose outer layer is polyester, polypropylene, or nylon, the middle class is the mixture of polyethylene, polystyrene or polyethylene, polystyrene, and a hydrogenation styrene block copolymer, and a heat sealant layer is a covering tape for an electronic-parts package which consists of thermoplastics and the mixture of a filler. The thickness of the biaxially oriented film whose desirable mode of this invention is an outer layer is 5-30 micrometers, and an interlayer's thickness is 5-50 micrometers. As opposed to the polyethylene 100 weight section whose melt flow rates are 10-30g / 10 minutes or [that it is the mixture whose polystyrene whose melt flow rates are 10-30g / 10 minutes is the 5 - 100 weight section] -- or It is the mixture with which the hydrogenation styrene block copolymer whose melt flow rates are 30-250g / 10 minutes comes to add 1 - 50 weight section into said mixture. Preferably, as being chosen out of a hydrogenation styrene-butadiene-styrene block copolymer and a hydrogenation styrene-isoprene-styrene block copolymer, a hydrogenation styrene block copolymer is a kind as it is few. As opposed to the polymethacrylate or the vinyl chloride vinyl acetate copolymer 100 weight section whose softening temperature the thickness of a heat sealant layer is 0.2-3 micrometers, and is 40-130 degrees C particle diameter is 1 - 60 weight ***** about the filler which is 0.2-20 micrometers -- the oxide particle which consists of mixture and uses as a principal component preferably any of silicon, magnesium, and calcium to be -- or It is any one sort or such mixture among a polyethylene particle, a polyacrylate particle, and a polystyrene particle, and is the covering tape for an electronic-parts package whose peel strength of a covering tape and a carrier tape is 10-120gr per seal width of face of 1mm.

[0006]

[Embodiment of the Invention] When drawing 1 explains the component of the covering tape 1 of this invention, an outer layer 2 is the biaxially oriented film which is polyester, polypropylene, or nylon, and it is a rigid high film in the transparence whose thickness is 5-30 micrometers. The thickness of rigidity is lost by 5 micrometers or less, and a covering tape becomes easy to go out. If 30 micrometers is exceeded, it will be too hard and a seal will become unstable.

[0007] As opposed to the polyethylene 100 weight section whose melt flow rates are 10-30g / 10 minutes as, as for an interlayer 3, cohesive failure happens or [that it is the mixture whose polystyrene whose melt flow rates are 10-30g / 10 minutes is the 5 - 100 weight section] -- or As opposed to the polyethylene 100 weight section whose melt flow rates are 10-30g / 10 minutes It consists of the mixture whose hydrogenation styrene block copolymer whose polystyrene whose melt flow rates are 10-30g / 10 minutes is the 5 - 100 weight section, and whose melt flow rates are 30-250g / 10 minutes is 1 - 50 weight section, and is the film whose thickness is 5-50 micrometers. About an interlayer's formation approach, the extrusion laminating method is cheap, and it sees from a health side and is the most desirable. Although not limited especially as a hydrogenation styrene block copolymer, a hydrogenation styrene-butadiene-styrene block copolymer and a hydrogenation styrene-isoprene-styrene block copolymer are desirable. If the melt flow rate of polyethylene uses the extrusion laminating method as a processing method when the melt flow rate of 10g / 10 minutes or less, or polystyrene is [the melt

flow rates of 10g / 10 minutes or less, or a hydrogenation styrene block copolymer] 30g / 10 minutes or less, film production with it cannot be performed. [the small spread nature of a film and] [suitable] Moreover, when the melt flow rate of 30g / 10 minutes or more, or polystyrene is [the melt flow rates of 30g / 10 minutes or more, or a hydrogenation styrene block copolymer] 250g / 10 minutes or more for the melt flow rate of polyethylene, film production with necking appropriate intense too cannot be performed.

[0008] An interlayer's cohesive failure does not break out that the content of polystyrene is below 5 weight sections to the polyethylene 100 weight section. Mixture worsens that they are more than the 100 weight sections, and it becomes impossible to produce a film. The visible-ray permeability of a film becomes 75% or less for the content of a hydrogenation styrene block copolymer to be below 1 weight section to the polyethylene 100 weight section. The thickness variation of a film arises in the case of the extrusion lamination by their being more than 50 weight sections. If the middle class's thickness is set to 5 micrometers or less by the extrusion laminating method, the variation in thickness will be large and suitable PIRUOFU reinforcement will no longer be obtained at the time of a seal. In 50 micrometers or more, DERAMI becomes easy to occur at the time of Peel. Both may be laminated through the glue line of thermoplastic molds, such as heat-curing molds, such as an isocyanate system and an imine system, and polyethylene, in order to raise the lamination reinforcement of an outer layer and an interlayer.

[0009] the heat sealant layer 4 is 1 - 60 weight ***** about the filler which is the particle size of 0.2-20 micrometers to polymethacrylate or the vinyl chloride vinyl acetate copolymer 100 weight section -- it consists of mixture and thickness is 0.2-3 micrometers. Although not limited especially as a filler, any one sort or such mixture are desirable among polyethylene particles, such as the oxide particle which uses as a principal component any of silicon, magnesium, and calcium to be, for example, a silica, and talc, a polyacrylate particle, and a polystyrene particle. Since it is very a thin film as the formation approach of this layer, a GURABYUA coating method is the most desirable. As polymethacrylate, a methyl methacrylate-butyl methacrylate copolymer is mentioned, for example. This can change softening temperature in 40-130 degrees C by changing a copolymerization ratio. As a vinyl chloride vinyl acetate copolymer, there is a thing like DIKKU seal A-100Z series (Dainippon Ink & Chemicals, Inc. make), for example. This can also adjust softening temperature by the lot number. When softening temperature is less than 40 degrees C, it may block at the time of storage of a covering tape, and if 130 degrees C is exceeded, it is necessary to make high the temperature conditions at the time of heat sealing, and there is a possibility that the carrier tape itself may be damaged in that case.

[0010] When the particle size of a filler was below 1 weight section and 0.2 micrometers or less or addition number of copies keeps a covering tape by hot environments 60 degrees C or more, the so-called blocking high a volume broth becomes impossible happens. Moreover, if the particle size of a filler is [20 micrometers or more or addition number of copies] more than 60 weight sections, transparency will get worse and light transmission will become 75% or less. It becomes impossible to obtain the PIRUOFU reinforcement by which is very difficult to make thickness regularity if the thickness of a heat sealant layer is 0.2 micrometers or less, and it was stabilized, and if it is 3 micrometers or more, cohesive failure will arise in a heat sealant layer, and PIRUOFU reinforcement will become unstable too. In order to give the electrostatic prevention effectiveness, an antistatic treatment layer or a conductive layer may be prepared in an outer layer side, i.e., the front rear face of a biaxially oriented film.

[0011] An interlayer's resin is formed so that the adhesive strength of this covering tape 1 and this carrier tape 6 may be preferably set to 10-70gr ten to 120 gr per seal width of face of 1mm. When PIRUOFU reinforcement is lower than 10gr(s), at the time of package object migration, a covering tape separates and there is a problem that the electronic parts which are contents are omitted. On the contrary, if higher than 120gr, the phenomenon which jumps out of a receipt pocket just before a carrier tape vibrates and being equipped with electronic parts, in case a covering tape is exfoliated, i.e., a jumping trouble, will be caused. By this invention, the engine performance in which the dependency of seal conditions is low and there is little aging of the PIRUOFU reinforcement by storage environment can be obtained.

[0012] According to this invention, since the visible-ray permeability of a covering tape is preferably constituted 75% or more so that it may become 80% or more, the electronic parts of the interior enclosed with the carrier tape can check it with viewing or a machine. When lower than 75%, the check of inner electronic parts is difficult.

[0013]

[Example] Although the example of this invention is shown below, this invention is not limited at all by these examples. To biaxial-stretching polyester film of 25 micrometers of thickness, by the combination formula shown in Table 1 and 2, the interlayer was produced by the extrusion laminating method (extrusion temperature: 280 degrees C) at 30 micrometers of thickness, the heat sealant layer was produced with the GURABYUA coating method at 1 micrometer of thickness, and the covering tape of lamination shown at drawing 1 was obtained. The obtained covering tape was heat sealed after the slit to 5.3mm width of face with the carrier tape made from PET of 8mm width of face, and the condition of blocking at the time of keeping a covering tape in an exfoliation device, PIRUOFU reinforcement, visible-ray transmission, and a 60-degree C environment was measured. The example was shown in Table 1 and the characterization result was shown in Table 2 about the example of a comparison.

[0014]

[Table 1]

		実施例1	実施例2	実施例3	実施例4	実施例5	実施例6	実施例7
中間層配合	ポリエチレン	100	100	100	100	100	100	100
	ポリスチレン	10	30	90	30	30	30	30
	SEBS	0	0	0	45	45	7	0
	SEPS	0	0	0	0	0	7	30
ヒートシール配合	熱可塑性樹脂	塩酢ビ 100	アクリル 100	塩酢ビ 100	アクリル 100	塩酢ビ 100	アクリル 100	アクリル 100
	フィラー (粒径 μm)	タルク 30 (3)	シリカ 3 (1.4)	ワックス 4 (10)	架橋珪素 55 (7)	シリカ 30 (3)	架橋珪素 2 (12)	架橋珪素 55 (7)
可視光線透過率		87	86	88	77	76	87	78
ヒートシール初期値(g/1mm巾)		48	51	62	45	30	54	43
ブロッキングの状態		○	○	○	○	○	○	○
剥離機構		凝集破壊	凝集破壊	凝集破壊	凝集破壊	凝集破壊	凝集破壊	凝集破壊

[0015]

[Table 2]

		比較例1	比較例2	比較例3	比較例4	比較例5	比較例6
中間層配合	ポリエチレン	100	100	100	100	100	100
	ポリスチレン	4	110	80	80	4	110
	SEBS	0	0	70	7	7	7
ヒートシート用シール配合	熱可塑性樹脂	塩酢ビ 100	アクリル 100	塩酢ビ 100	アクリル 100	塩酢ビ 100	アクリル 100
	フィラー (粒径 μm)	タルク 70 (3)	シリカ 0.5 (1.4)	ワックス 40 (10)	架橋ワックス 0.5 (30)	シリカ 30 (0.1)	架橋シリカ 2 (12)
可視光線透過率		64	70	71	64	84	72
ビニール強度 初期値(g/1mm ²)		10	72	12	55	8	67
ブロッキングの状態		○	×	○	×	×	○
封離機構		界面封離	凝集破壊	界面封離	凝集破壊	界面封離	凝集破壊

[0016] An abbreviated name, the contents, etc. of a monograph affair and resin are as follows.

- Heat-sealing conditions : 160degreeC/1kg/cm²/0.1sec., seal width of face 0.4mmx2 and Peel conditions : 180-degree Peel, Peel speed The figure of 300 mm/min.n=3 and middle class combination shows the weight section of each resin to the polyethylene 100 weight section.

- The figure of heat sealant layer combination shows the weight section of the filler to the thermoplastics 100 weight section.

- condition [of blocking]: -- O; blocking of is not done -- doing x; blocking of, it is not practical.

- salt vinyl acetate: -- a vinyl chloride vinyl acetate copolymer (softening temperature: 45 degrees C) (DIKKU seal A-100Z-5A: Dainippon Ink & Chemicals, Inc. make) and acrylic: -- a methyl methacrylate-butyl methacrylate copolymer (softening temperature: 60 degrees C) (product made from Osaka Printing ink Manufacture), and talc: -- inorganic filler (micro ace L-1: product made from Japanese Talc) wax: which uses the water silicate mineral of magnesium as a principal component -- polyethylene wax and bridge formation acrylic, and bridge formation styrene: -- what constructed the bridge in each resin (Soken Chemical & Engineering make)

- silica: -- melt flow rate [of the inorganic filler polyethylene which uses a silicon dioxide as a principal component]: -- melt flow rate [of 20g / 10 minute, and polystyrene]: -- 22g -- a / 10 minute and, and

SEBS:hydrogenation styrene-butadiene-styrene block copolymer (melt flow rate: 120g / 10 minutes)

- SEPS : hydrogenation styrene-isoprene-styrene block copolymer (melt flow rate: 150g / 10 minutes)

[0017]

[Effect of the Invention] If this invention is followed, PIRUOFU reinforcement can be set as arbitration in the range of 10-120gr per mm, the problem that the dependency over the seal conditions of the PIRUOFU reinforcement which is the conventional trouble is large, the problem which changes with the storage environment of many functions with time, a DERAMI problem, an aggregate problem, and a transparency problem can be solved, and the stable PIRUOFU reinforcement can be obtained.

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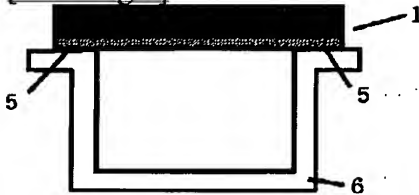
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]